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DRAWINGS ATTACHED

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(19)

(54) WARM FOOTWEAR

(71) I, SADAO SHIMIZU, a citizen of Japan, residing at No. 4—3—1, Kita-Shinjuku, Shinjuku-ku, Tokyo, Japan, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to heated footwear.

In winter season and in cold northern districts, keeping the feet warm is an important matter from the standpoint of protecting them from coldness and frostbite. In some areas where it is bitterly cold, merely putting on shoes is not sufficient to keep the feet warm. One method of keeping the feet warm is to place a fur inside the shoes and wear several pairs of socks. This method has the disadvantage that the footwear is bulky making walking difficult and furthermore, the feet are not kept sufficiently warm.

An object of the present invention is to provide a heated article of footwear in which a heating unit is accommodated inside of the article of footwear to effect heating of the footwear.

According to the present invention there is provided heated footwear having an insole of ventilating structure which is spaced from the sole of the footwear, the insole and the heel of the footwear defining a heat insulating chamber therebetween within which is housed a heating unit.

The heating unit may be a pocket heater and may be located in the heel portion of low shoes for gentlemen, or high heels for ladies. The location of the heating unit at the heel portion of the footwear protects the unit from shocks.

The heating unit is fitted and accommodated in stabilized condition in a heat insulating chamber formed in the upper part of the heel or an accommodating recess formed in the heel, and thus extremely efficient heating action is obtained. The heating unit may be detachable from the heat insulating chamber or the accommodating recess, to permit fuel to be supplied to the unit.

The present invention may be applied to any type of footwear such as for example footwear for use in sports and leisures such as skiing, skating, or mountain climbing in winter, and fishing.

The invention will now be described by way of example only with particular reference to the accompanying drawings.

In the drawings:

Fig. 1 is a perspective front view of the low shoes to which the present invention is applied;

Fig. 2 is an elevational cross section showing the internal construction;

Fig. 3 is an elevational cross section with part omitted showing the condition where a heating unit is taken out from a heat insulating chamber by opening an insole;

Fig. 4 is an elevational cross section with part omitted showing the removal of the heating unit similar to that in Fig. 3;

Fig. 5 is an elevational cross section with part omitted showing another embodiment related to the fitting of the heating unit;

Fig. 6 is a perspective view showing the construction of one embodiment of the sole portion and the heel portion;

Fig. 7 and Fig. 8 are elevational cross sections with part omitted respectively showing the other embodiments related to the fitting of the heating unit;

Fig. 9 is an elevational cross section with part omitted showing the embodiment related to the construction in which the heating unit is accommodated inside of the heel; and

Fig. 10 is a partial enlarged cross section showing one example of the fitting construction of a counter portion of the upper.

The embodiments shown in Figs. 1 to 8 are low heeled shoes for gentlemen and the embodiment shown in Fig. 9 is a high heeled shoes for ladies.

Referring to Figs. 1 to 8, an article shown generally by a reference numeral 1 is a low shoe for gentlemen having a sole 2 and a

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heel 3. The shoe 1 shown in the drawings has an instep which is formed slightly higher than the normal type shoes as shown in the drawings, but otherwise is constructed in a manner similar to ordinary shoes.

The shoe 1 has an insole 4 made of a thin metal plate which is spaced from the sole 2, and this insole is formed with a plurality of vent holes 5. An insock 6 is formed on the upper surface of the insole 4, the insock 6 being made of a material having ventilating property e.g. meshed cloth. A plurality of hemispherical interposing members 7 are mounted on the undersurface of the insole 4, at suitable intervals between the toe of the shoe and the plantar arch. The interposing members 7 maintain the front portion of the insole 4 at a predetermined interval L from the sole 2, and warm air generated by a heating unit to be described hereinafter circulates and convects over the entire undersurface of the insole 4. The rear side portion of the insole 4, namely the portion positioned at the upper portion of the heel 3, is constructed such that its peripheral edge is mounted on a supporting frame 8 provided along the peripheral edge of the rear part of the sole 2. The upper portion of the sole 2 of the heel 3 is spaced from the rear part of the insole 4 to form a heat insulating chamber 9. The heat insulating chamber 9 is positioned at the upper portion of the heel 3 which is the most strongly-built portion of the shoe. The insole 4 forming the upper wall is in engagement with the supporting frame 8 and is resistant to collapse and also can adequately withstand external pressure.

The shoe 1 can be heated by a heating unit such as a pocket heater. The pocket heater mentioned herein is formed of a metal container which is filled with asbestos. The asbestos is soaked with volatile oil which is suitably ignited. Such a heater can store and provide heat for many hours.

There are two main ways in which the heating unit can be fitted into the shoe. The first is where the heating unit is accommodated inside the heat insulating chamber 9 as shown in Figs. 2 to Fig. 7. The second is where the heating units is accommodated under the heat insulating chamber 9, namely, in the heel as shown in Fig. 8 and Fig. 9. In each case, the heating units is detachably fitted in the shoe, thus making it possible to exchange the heating unit and to supply fuel. The heating unit which is to be housed in the heat insulating chamber 9, as shown by reference number 10, is made of generally box type of thin plate and is provided with a flame orifice 10a at its tip. When the heating unit 10 is accommodated in the condition where the flame orifice 10a is directed towards the toe of the shoe as shown in the drawing the following methods of construction are available.

Referring, initially to Figs. 2 to 4, the rear part of the insole 4, namely the upper wall portion of the heat insulating chamber 9, can be lifted together with the insock 6 whereby the accommodation and removal of the heating unit 10 become feasible. The end edge of the insole 4 and the upper edge of the supporting frame 8 are fitted with tape 15a, and 15b to hold said edge portions together when they are brought into contact.

A second method of accommodating the heating unit 10 in the heat insulating chamber 9 is shown in Fig. 5. In this embodiment, the heating unit 10 is constructed in such a way that it can be placed into or removed from the heat insulating chamber 9 through an opening 11 formed in the rear part of the shoe 1. An advantage of this construction is that when the heating unit 10 is exchanged, it can be done without removing the shoe 1. The rear edge of opening 11 is provided with packing 11a and 11b which is arranged to engage the rear end of unit 10.

Although the heating unit 10 is accommodated inside of the heat insulating chamber 9 by the means mentioned in the foregoing, the construction of supporting the accommodated heating unit 10 in the heat insulating chamber 9 will be described in the following. If the heating unit is allowed any degree of movement in the heat insulating chamber 9 when in use the heating unit 10 may be broken, and this may result in a burn. This problem is solved by the following means.

Referring first to Fig. 2, Fig. 3, Fig. 5 and Fig. 7, supporting projecting members 12a, 12b are provided as a first means for holding the heating unit 10. The members 12a protrude from the undersurface of the insole 4 and the members 12b from the upper surface of the sole 2. When the shoe is in use the members 12a, 12b engage the upper and under surfaces of the flame orifice 10a of the heating unit 10 accommodated in the heat insulating chamber 9, whereby the unit is held and retained in position.

A second means is shown in Fig. 4 or Fig. 8. A depressed portion 13 or 13a is formed in the lower surface of the heat insulating chamber 9, and in this depressed portion, the lower portion 10B of heating unit 10 is fitted. In the embodiment of Fig. 4, as the depressed portion 13 is shallow, the upper surface of the heating unit 10 is adapted to be pressed and supported by means of a pressure member 14 mounted on the inside of the openable insole 4. Reference numeral 14a shows a vent hole of the pressing member 14. In the embodiment of Fig. 8, the depressed portion 13a is relatively deep and extends to the inside of the heel 3. The heating unit 10B is adapted to be fitted therein, and accordingly, in this embodiment, there is no need for a member corresponding to the pressure member 14 shown in Fig. 4. In this embodi-

ment the heating unit 10 comprises a cylindrical member as shown in the drawing.

As described in the foregoing, various types and constructions of heating units may be employed according to the purposes of use. Referring to Fig. 7, a heating unit designated by reference numeral 10A is formed slightly longer than the heating unit shown in Figs. 2 to 5, and the flame orifice 10a is formed so as to extend to the portion of the plantar arch of the shoe 1, and thus a device for improving the heating effect is provided. Accordingly, in this case, the heat insulating chamber 9 that accommodates the heating unit 10A is, of course, formed slightly longer than that of the embodiments described previously.

All the embodiments described in the foregoing are of the constructions in which the heating units is directly accommodated in the heat insulating chamber 9, but the accommodating portion is not limited to the heat insulating chamber 9 only, and there is a case where it is accommodated inside of the heel. Fig. 9 shows one embodiment of such a case, wherein an accommodating hole 16 is cut from the portion of the sole 2 of the bottom surface of the heat insulating chamber 9 so that it extends to the inside of the heel 3a. This hole 16 is formed deeper than the depressed portion 13a shown in the embodiment of Fig. 8, and it is formed so as to accommodate the heating unit 10C completely. As explained in the foregoing, the construction in which the heating unit 10C is accommodated in the heel 3a is applied particularly to the case of a high heel shoe 1a as shown in Fig. 9. An inserting hole 17 is cut in the side surface of the heel 3a, and this hole communicates with the accommodating hole 16, thus permitting the heating unit 10C to be inserted into the accommodating hole 16 from the inserting hole 17. A cover 18 can be mounted on an edge of an opening of the inserting hole 17.

The accommodation of the heating unit 10C in the heel 3a protects the heating unit 10C from the external shock since heel 3a is hard. This construction permits the exchange of the heating unit 10C while the shoes are being worn and therefore such construction can demonstrate various and many effects mentioned above.

Fig. 10 shows one embodiment of the means for fitting a counter portion of an upper to the side of the sole 2. The shoes related to the present invention tends to have a high counter portion in order to accommodate the heating unit inside thereof. Such shoes have the drawback that the shape around the periphery of the heel tends to collapse.

The embodiment shown in Fig. 10 shows a construction which solves the problem, wherein a tongue member 21 is sewn to the inside of the counter portion of the upper of the heel, and this tongue member 21 is sandwiched and fixed between the inner sole 20 interposed on the upper surface of the sole 2 on the heel and the under surface of the supporting frame 8 mounted on the inner sole 20. The lower edge 19 of the counter portion of the upper is sandwiched and fixed between the inner sole 20 and the sole 2. When the counter portion of the upper is fitted, the fitting of the tongue member 21 sewn to the intermediate portion of the said counter portion as explained in the foregoing strongly builds the counter portion and reduces the deformation as compared with the conventional method in which the lower edge only is fitted. An advantage of the high counter portion of the upper of the present shoe is that it can withstand a long period of use. This kind of fitting means can be applied to particularly the case of shoes for ladies as shown in Fig. 9.

The description of the drawings mentioned in the foregoing are merely examples of the embodiments of the present invention, and it should be understood that various changes can be made in the form, details, arrangement and proportions of the various elements without departing from the scope of the invention.

WHAT I CLAIM IS:—

1. Heated footwear having an insole of ventilating structure which is spaced from the sole of the footwear, the insole and the heel of the footwear defining a heat insulating chamber there between within which is housed a heating unit.

2. Heated footwear as claimed in claim 1 wherein the insole can be raised to permit removal and insertion of the heating unit.

3. Heated footwear as claimed in claim 1 wherein an aperture is formed in the counter portion of the upper, the heating unit being locatable in said chamber through said aperture.

4. Heated footwear as claimed in any preceding claim wherein a recess is formed in the upper surface of the heel, said recess being arranged to accommodate the heating unit.

5. Heated footwear as claimed in claim 1 wherein a recess is formed in the heel and an aperture is formed in the side of the heel, said aperture communicating with said recess and the heating unit being locatable in said recess via said aperture.

6. Footwear substantially as herein described with reference to and as illustrated in Figures 1 to 3, 4, 5, 6, 7 and 8 and 10 of the accompanying drawings.

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FIG. 1

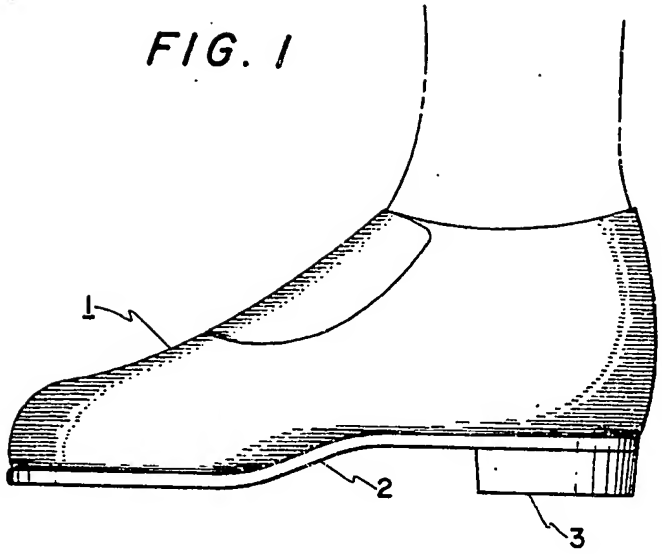


FIG. 2

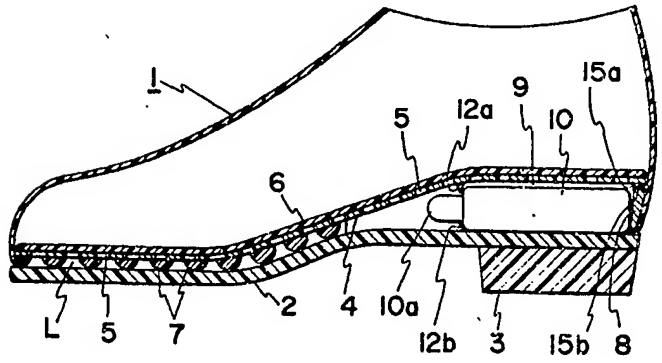
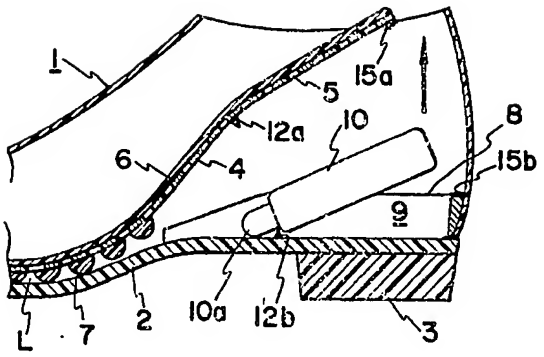


FIG. 3


1
5
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12a
10
8
6
4
15b
9
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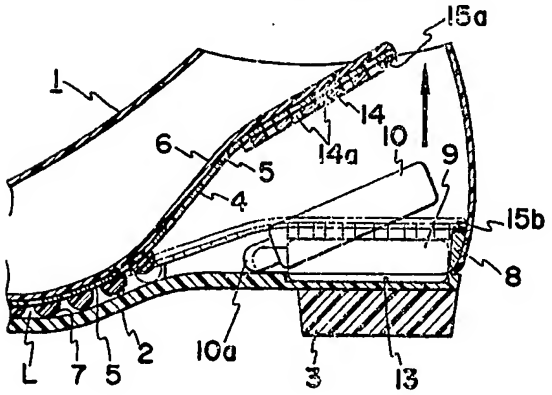
7
2
10a
12b
3

FIG. 4


15a
1
14
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15b
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10a
3
13

FIG. 5

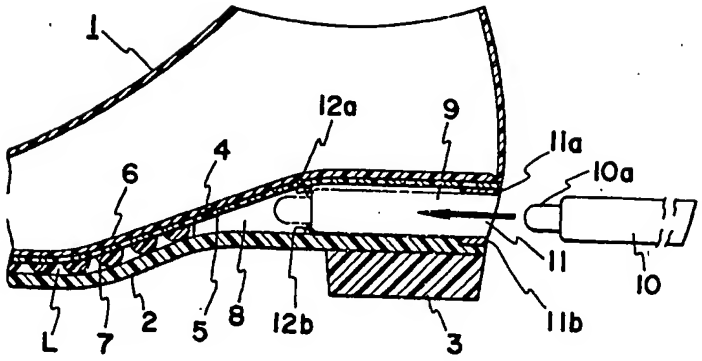

FIG. 6

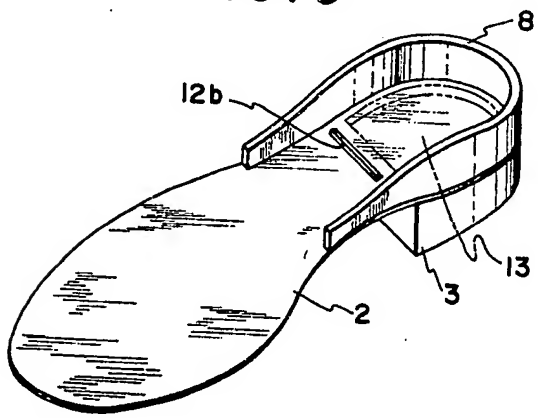

FIG. 7

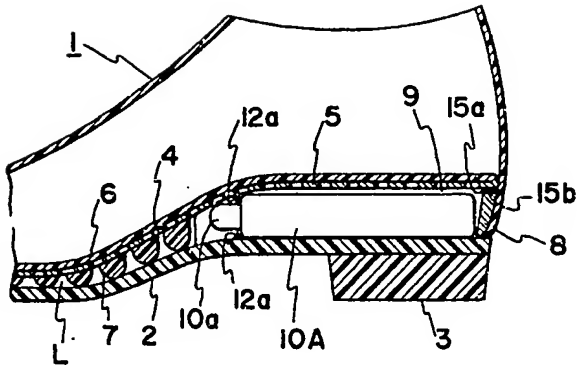
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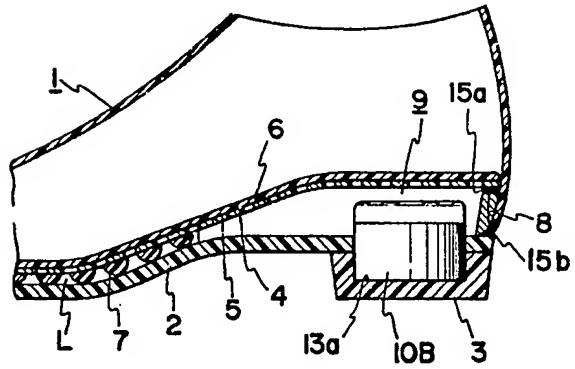
FIG. 8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13a
10B
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FIG. 9

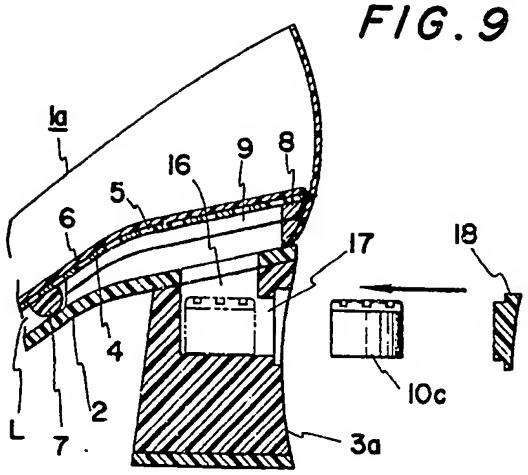

FIG. 10